

WHAT IS CLAIMED IS:

1. A multilumen catheter for directing blood through a single cannulation site, said catheter comprising:

a catheter body having a proximal end, a first distal end, and a second distal end, said first distal end extending distally farther from the proximal end than the second distal end, said catheter body configured to enable the catheter to be applied through a single cannulation site;

a first lumen extending between said first distal end and said proximal end;

a second lumen extending between said second distal end and said proximal end; and

a third lumen having a distal end and a proximal end configured to be positioned entirely within the patient's vascular system.

2. The multilumen catheter of Claim 1, further comprising at least one aperture in one of said lumens positioned near the proximal end of the catheter body so that the aperture may maintain or enhance perfusion of blood to the patient's vasculature downstream of where the aperture resides in said vasculature when said catheter is inserted into the patient for treatment.

3. A system comprising:

the multilumen catheter of Claim 2:

a pump;

a first conduit fluidly engaged to the first lumen; and

a second conduit fluidly engaged to the second lumen, said first and second conduits fluidly coupled to said pump so that when the system is applied to a patient, said pump circulates blood from one of the first distal end and the second distal end to the other of the first distal end and the second distal end and also through the at least one aperture.

4. A system comprising:
  - the multilumen catheter of Claim 1;
  - a pump;
  - a first conduit fluidly engaged to the first lumen; and
  - a second conduit fluidly engaged to the second lumen, said first and second conduits fluidly coupled to said pump so that when the system is applied to a patient, said pump circulates blood from one of the first distal end and the second distal end to the other of the first distal end and the second distal end.
5. The multilumen catheter of Claim 1, wherein the distal end of the third lumen is tapered.
6. The multilumen catheter of Claim 5, wherein the proximal end of the third lumen is tapered.
7. A multilumen catheter for directing blood through a single cannulation site, said catheter comprising:
  - a catheter body having a first lumen for directing blood between a first blood vessel and a device, a second lumen for directing blood between a second blood vessel and said device, and a third lumen having a distal end and a proximal end configured to be positioned entirely within the patient's vascular system.
8. The multilumen catheter of Claim 7, further comprising a J-tip located at a distal end, wherein said first lumen extends between a proximal end and said distal end.
9. The multilumen catheter of Claim 8, wherein said J-tip comprises a bend and an aperture positioned at the distal-most portion of the bend.
10. The multilumen catheter of Claim 7, wherein the distal end of the third lumen is tapered.

11. The multilumen catheter of Claim 10, wherein the proximal end of the third lumen is tapered.

12. The multilumen catheter of Claim 7, further comprising a radiopaque marker, wherein the radiopaque marker can be used to position the catheter when the catheter is applied to a patient.

13. The multilumen catheter of Claim 7, further comprising an indicator near a proximal end of the catheter body, wherein the indicator can be used to position the catheter when the catheter is applied to a patient.

14. A system comprising:

the multilumen catheter of Claim 7;

a pump;

a first conduit fluidly engaged to the first lumen; and

a second conduit fluidly engaged to the second lumen, said first and second conduits fluidly coupled to said pump so that when the system is applied to a patient, said pump circulates blood from one of the first distal end and the second distal end to the other of the first distal end and the second distal end.

15. The multilumen catheter of Claim 7, wherein at least one of said lumens comprises at least one aperture positioned on said catheter body to maintain or enhance perfusion of blood to the patient's vasculature downstream of where the aperture resides in said vasculature when said catheter is inserted into the patient for treatment.

16. A system comprising:

the multilumen catheter of Claim 15;

a pump;

a first conduit fluidly engaged to the first lumen; and

a second conduit fluidly engaged to the second lumen, said first and second conduits fluidly coupled to said pump so that when the system is applied to a patient, said pump circulates blood from one of the first distal end and the second distal end to the other of the first distal end and the second distal end and also through the at least one aperture.

17. The multilumen catheter of Claim 1, further comprising a Y-connector positioned at the proximal end of the catheter body, wherein a first leg of the Y-connector is in fluid communication with said first lumen and a second leg of the Y-connector is in fluid communication with said second lumen.

18. An extracardiac pumping system for supplementing blood circulation in a patient without any component thereof being connected to the patient's heart, the extracardiac system comprising:

- a pump configured to pump blood through the patient at subcardiac flow rates; and

- a multilumen catheter for directing blood through a single cannulation site, said catheter comprising at least three lumens, a first lumen for directing blood between a first blood vessel and said pump, a second lumen for directing blood between a second blood vessel and said pump, and a third lumen having a distal end and a proximal end configured to be positioned entirely within the patient's vascular system, said catheter adapted for insertion through a single cannulation site.

19. The system of Claim 18, further comprising:

- a first conduit fluidly coupling said pump to said first lumen, whereby blood may be directed between the pump and the first blood vessel; and

- a second conduit fluidly coupling said pump to said second lumen, whereby blood may be directed between the pump and the second blood vessel.

20. The system of Claim 18, wherein said first lumen is longer than said second lumen.

21. The extracardiac pumping system of Claim 20, wherein said system is configured to direct blood in said first lumen to said pump and to direct blood from said pump to said second lumen.

22. The extracardiac pumping system of Claim 20, wherein said system is configured to direct blood in said second lumen to said pump and to direct blood from said pump to said first lumen.

23. The extracardiac pumping system of Claim 18, wherein at least one of said lumens comprises at least one aperture positioned near a proximal end of the multilumen catheter so that the aperture may maintain or enhance perfusion of blood to the patient's vasculature downstream of where the aperture resides in said vasculature when said catheter is inserted into the patient for treatment.

24. A method of treating a patient comprising:

inserting a multilumen catheter into the patient through a single cannulation site into a first blood vessel,

the multilumen catheter comprising a catheter body having a proximal end, a first distal end, a second distal end, said first distal end extending distally farther from the proximal end than the second distal end, a first lumen extending between said first distal end and said proximal end, a second lumen extending between said second distal end and said proximal end, and a third lumen having a distal and a proximal end configured to be positioned entirely within the patient's vascular system,

withdrawing blood from the vasculature of the patient through one of said first or said second lumens, and

delivering blood to the vasculature of the patient through the other of said first or second lumens.

25. The method of Claim 24, further comprising advancing said multilumen catheter until said first lumen is in fluid communication with a second blood vessels and said second lumen is in fluid communication with said first blood vessel.

26. The method of Claim 25, wherein the withdrawing step further comprises withdrawing blood from said second vessel through said first lumen and wherein the delivering step further comprises delivering blood to said first vessel through said second lumen.

27. The method of Claim 25, wherein the withdrawing step further comprises withdrawing blood from said first vessel through said second lumen and wherein the delivering step further comprises delivering blood to said second vessel through said first lumen.

28. A multilumen catheter for directing blood through a single cannulation site comprising:

- a catheter body having a proximal end configured to enable the catheter to be applied through a single cannulation site, a first distal end, a second distal end, a first lumen extending between said first distal end and said proximal end, and a second lumen extending between said second distal end and said proximal end;

- said first distal end extending farther from the proximal end than the second distal end; and

- a means for passively maintaining or enhancing perfusion to the patient's vasculature downstream of a point of entry of said catheter into a blood vessel when said catheter is inserted into the patient for treatment.

29. The multilumen catheter of Claim 28, wherein the passive perfusion means is a third lumen having a distal end and a proximal end configured to be positioned entirely within the patient's vascular system.

30. A multilumen catheter for directing blood through a single cannulation site comprising:

a catheter body having a proximal end configured to enable the catheter to be applied through a single cannulation site, a first distal end, a second distal end, a first lumen extending between said first distal end and said proximal end, and a second lumen extending between said second distal end and said proximal end, said first distal end extending further from the proximal end than the second distal end;

a tip located at the first distal end of the catheter for directing blood from the first lumen into the vasculature;

means for connecting a first conduit to said first lumen and for connecting a second conduit to said second lumen; and

means for passively maintaining or enhancing perfusion to the patient's vasculature downstream of a point of entry of said catheter into a blood vessel when said catheter is inserted into the patient for treatment.

31. The multilumen catheter of Claim 30, wherein the passive perfusion means comprises a third lumen having a distal end and a proximal end configured to be positioned entirely within the patient's vascular system.

32. The multilumen catheter of Claim 30, wherein the means for connecting comprises a Y-connector positioned at the proximal end, wherein a first leg of the Y-connector is in fluid communication with said first lumen and a second leg of the Y-connector is in fluid communication with said second lumen.